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EnviroGroup Limited
The environmental solutions company

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David Mellard, Ph.D.
Division of Health Assessment and Consultation
Agency for Toxic Substances and Disease Registry
1600 Clifton Road NE (E-42)
Atlanta, GA

RE: Comments on Public Health Assessment Working Draft
VB-I70 Site

Dear Dr. Mellard:

This letter provides comments, on behalf of ASARCO Incorporated, on the working draft of the Public Health Assessment report for the Vasquez Boulevard – I70 NPL Site, which you distributed at the December 9, 1999 meeting of the Working Group.

p.3, Public Health Issues:

The PHA does not address items 3 and 4.

p.4, Site History:

We understand that this section of the draft PHA has been revised. Comments on the revised Site History text will be provided under separate cover.

p.7, Environmental Data and Contaminants of Concern Requiring Further Evaluation, Arsenic, 1st (carry-over) paragraph:

The PHA implies that arsenic concentrations above 7 ppm are above naturally occurring levels. However, 7 ppm is the arithmetic *mean* concentration of naturally occurring arsenic in western U.S. soils (ATSDR 1992). Therefore, roughly half of all natural western U.S. soils can be expected to have a concentration that is higher than 7 ppm. In fact, according to ATSDR (1992) and the original source report (Shacklette and Boerngen 1984), arsenic values in natural soils were found to range up to 97 ppm. Therefore, the number of properties with arsenic concentrations between 7 ppm and detection levels (44 to 57 ppm) is not a meaningful parameter, as it could include both properties with natural background levels of arsenic, and properties impacted by human activities. For this reason, we suggest deleting the first full sentence on page 7. Alternatively, the PHA should make it clear that 7 ppm is just an average concentration, and that actual concentrations in natural soils can be higher or lower.

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p.7, Arsenic, 2nd paragraph:

The United States Geological Survey (USGS) collected surface soil samples between 1972 and 1974 throughout the Front Range of Colorado, including some locations in metropolitan Denver, and analyzed these samples for a variety of metals, including arsenic (Tourtelot, 1992). Based on these data, the geometric mean concentration of arsenic in the urban Denver area (none of the samples were collected near the Globe, Argo, or Omaha-Grant smelters), is 7.2 ppm, with a geometric standard deviation of 2.4. Therefore, the background arsenic population in Denver, commonly defined by the geometric mean multiplied or divided by two geometric standard deviations (Rose et al. 1979), is 1 ppm to 42 ppm. The maximum value reported by Tourtelot (1992) was 82.3 ppm, for a sample collected south of the VB-I70 site.

It should also be noted that TRC (1992) estimated the "upper limit of background" for arsenic in the Globeville area to be 28 ppm, using a statistical technique designed to distinguish between two populations (e.g., background and anthropogenic) in the same sample area (e.g., see Rose et al. 1979). Therefore the presence of elevated arsenic within the area as the background population was accounted for by the evaluation methodology. While this method of distinguishing between background and elevated arsenic populations is not precise, it should not be characterized as "not reliable". In fact, the TRC "upper limit" of background value compares well with the data reported by the Tourtelot (1992).

p.7, Cadmium, 2nd paragraph:

The background levels of cadmium cited from Kabata-Pendias and Pendias (1992) are for natural soils and do not reflect background levels in urban areas. For example, Kabata-Pendias and Pendias (1992) tabulate data from various studies showing that cadmium in urban gardens may range up to 100 ppm and that cadmium in soils in the vicinity of highways range from 1 to 10 ppm. Further, cadmium is a common pigment in paint and a contaminant in used motor oils. Therefore, the PHA should make it clear that the cadmium range cited is for natural soils and that soils in any urban area are likely to have higher concentrations. In fact, Skyline Labs, Inc. (1986) presents cadmium concentrations in soils collected on a one mile grid across metropolitan Denver. The geometric mean concentration in urban Denver (not including samples within one mile of the Globe Plant) was 2.2 ppm, with a geometric standard deviation of 1.6. Therefore, the population range represented by the mean multiplied or divided by two times the standard deviation is 0.8 ppm to 5.6 ppm.

p.8, Other Contaminants of Concern, 1st paragraph:

The PHA should clarify that 65 ppm is the *average* zinc concentration in naturally occurring soils.

According to the EPA Phase III Project Plan (Appendix A) for the VB-I70 site, the thallium values originally reported by EPA and referenced in the PHA were

anomalous, likely due to the method of analysis (ICP-trace). The correct mean concentration using ICP-MS and GFAA is reported to be 0.45 ppm (see Appendix A of the Project Plan).

Statements should be added indicating that harmful effects due to zinc are unlikely and that no further evaluation of the harmful effects of zinc will occur in the PHA (similar to the statements made for cadmium and thallium).

p.10, Information from EPA's Regional Geographic Initiative, 1st paragraph:

TRI emissions do not necessarily lead to "pollution". Therefore, having the second highest TRI emissions does not necessarily mean that 80216 is the second most polluted zip code in Denver.

We note that Public Health Issue No. 3, as described on p.3 of the PHA, is not fully addressed. Other chemicals in the environment are listed in this section, but the potential for exposure or threat to public health are not discussed here or later in the PHA.

p.11, last paragraph:

The ASARCO Globe Plant in not an NPL site. The site was proposed for listing in 1993 but was never listed.

p.13, Soil ingestion for children and adults, last paragraph:

The studies from which the percentages of pica were derived may have selection bias and therefore may not be representative of the general population. For example, the paper on eating clay is specific to one part of the U.S. and the soil type of that area.

p.14, Soil ingestion for children and adults, 1st (carry-over) paragraph:

The phrase "some time during their pre-school years" is vague. The PHA should state more precisely the findings of Calabrese and Stanek (1998), who estimate that 33 percent of pre-school children will have 1 to 2 days per year when they have the high soil ingestion rates. Calabrese and Stanek (1998) also acknowledge that this value is a model estimate based on daily soil ingestion estimates and is likely to overestimate soil ingestion. It is also not likely that high soil ingestion events would occur throughout the pre-school period. Children in the 1 to 3 year old range would have the highest likelihood of high soil ingestion events due to their mouthing behavior and mobility.

p.15, Sediment and surface water ingestion for children and adults, 2nd paragraph:

A summary of surface water and sediment data collected by various agencies for the South Platte River is provided in the Asarco Globe Plant Remedial Investigation Report (TRC 1988).

p.17, Lead distribution in the study area, 1st paragraph:

The pattern of increasing lead concentration toward the southwest corner of the VB-I70 study area is consistent with the Skyline Labs, Inc. (1986) data, which show that lead concentrations are generally higher in the oldest part of the city; e.g., the industrialized South Platte River valley and the downtown area, centered roughly around Colfax Avenue and Broadway. Nevertheless, elevated lead concentrations (e.g., above 500 ppm and even 1000 ppm) were found throughout the metropolitan area.

The potential correlation between lead concentration and house age and condition should also be evaluated. Older houses are more typically found to the west and south, closer to the original city center. Numerous literature references note the correlation between lead in soil and older, less maintained, wood frame homes.

Both zinc (zinc oxide and zinc sulfate) and lead (lead carbonate, sulfate, and silicate) were common white paint pigments. Therefore, correlation between these two compounds is consistent with paint sources.

p.21, first (carry-over) paragraph:

The amount of soil eaten may also affect how much arsenic is absorbed into the body.

p.22, last paragraph:

We assume that the "two properties in the study area with the highest average arsenic levels" are two of the 18 properties that were remediated. When the PHA refers to specific properties or arsenic levels, it should clarify whether or not those properties have been remediated (i.e., whether the exposure is current or historic).

p.24, 1st checked item, and footnote 16:

Regarding the assumption of linear risk, we point out that the U.S. EPA assembled a panel of experts on arsenic carcinogenicity. The consensus conclusion of the panel was that based on the scientific evidence, the dose-response relationship for arsenic carcinogenicity would either show a threshold or would be nonlinear such that the slope of the relationship would decrease as the dose decreased (ERG 1995). Such a relationship would result in a carcinogenic hazard at high doses that would overestimate risk at low doses. Although how arsenic causes cancer is not completely understood, all plausible mechanisms would have a nonlinear dose-response for carcinogenicity.

p. 24, 4th checked item:

Insert "poor" before "nutrition of people in the Taiwan study."

Figures

The Omaha-Grant site is not plotted correctly on the figures. It was located directly south of the currently plotted location, between Brighton Boulevard and Interstate 70.

The Globe Plant boundaries are not accurate. The western boundary is somewhat east of the rail line. A small parcel at the southeast corner is also owned by others.

There appears to be a plotting error on Figure 26. The color scheme for the tall spike repeats itself (i.e., from bottom to top, black, white, red, green, yellow, indigo, red, blue, then it repeats white, red, green, yellow, blue, rather than following the color progression in the legend).

* * *

Thank you for the opportunity of commenting on the working draft of the PHA.

Sincerely,
EnviroGroup Limited

David J. Folkes, P.E.
Principal

Attachment: references

Cc: Bonnie Lavelle, USEPA
Bob Litle, Asarco
Linda Larson, Esq.
Joyce Tsuji, Exponent

REFERENCES

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